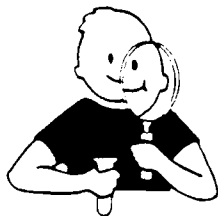# mecc

backyard birds

instructional computing courseware
for the apple® II computer

a product from the
science inquiry collection

This manual is compatible

with

the *Backyard Birds* disk

Version 1.x

June 1989

TABLE OF CONTENTS

AN OVERVIEW OF MECC'S *SCIENCE INQUIRY COLLECTION*

MECC's *Science Inquiry Collection* is a set of software packages especially designed for elementary and junior high science students. Each package covers a specialized topic in the physical, earth, or life science curriculum areas. All of the packages emphasize science process skills appropriate to the skill level of the student and contain accurate scientific content in the school science curriculum. The products in the *Science Inquiry Collection* incorporate several features that promote student achievement in elementary science, such as:

- instructional objectives that are directly correlated with the objectives addressed in popular science textbooks;

- scientific content that is accurate and important for students to learn;

- thinking processes that are appropriate to the developmental level of the students;

- motivational presentations that stimulate student interest;

- flexible material that can be used in a variety of educational environments; and

- instructional approaches that promote active student involvement and investigative learning.

All instructional materials are most powerful when they are used with other educational experiences rather than when used alone. The packages in MECC's *Science Inquiry Collection* encourage additional student involvement, beyond computer-based learning, in the following ways:

- The packages in this collection provide students with an open and creative environment in which they may develop and apply their problem-solving techniques.

- Students can utilize a variety of approaches when using the program.

- By freely sharing their discoveries, students can compare and explore the various techniques and thereby strengthen their ability to apply appropriate problem-solving approaches.

- Each package presents instructional material and learning experiences that can be readily transferred to concrete, hands-on classroom activities. Students can therefore become active participants in the learning process.

AN OVERVIEW OF MECC'S *SCIENCE INQUIRY COLLECTION* (continued)

The courseware packages described in the following chart compose the *Science Inquiry Collection* for elementary and junior high schools. These eight software packages address topics in the physical and life science strands of the elementary and junior high school science curriculums and stress age-appropriate scientific processes. Additional products planned for this collection will focus on topics in earth science. The products are specifically designed to support and complement actual hands-on experimentation in the classroom.

Each of the process categories listed actually encompass several skills. For instance, the category entitled "Organizing" includes such skills as information-gathering, sequencing, comparing, and classifying.

	Physical Science				*Life Science*			
	Mystery Objects	Mystery Matter	Miner's Cave	Wood Car Rally	Lunar Greenhouse	Backyard Birds	Weeds to Trees	Invisible Bugs
Grade Levels	2-4	3-6, Jr. High	3-6, Jr. High	3-6, Jr. High	3-6, Jr. High	3-6, Jr. High	3-6, Jr. High	3-6, Jr. High
Topic	Properties of Objects	Properties of Matter	Motion	Simple Machines	Plant Growth	Bird Identification	Plant Succession	Genetics
Scientific process used:								
Observing	√	√	√	√	√	√	√	√
Communicating	√	√	√	√		√	√	√
Comparing	√	√	√	√		√	√	√
Organizing		√	√	√	√	√	√	√
Relating		√	√	√	√	√	√	√

INTRODUCTION

Backyard Birds is a discovery-learning simulation that capitalizes on the natural curiosity of students and encourages them to use their curiosity while developing appropriate scientific processes and learning scientific content.

Backyard Birds is part of MECC's *Science Inquiry Collection*. Like all the packages in this collection, *Backyard Birds* features a strong process orientation while presenting material that is firmly anchored in the elementary and junior high school science curriculum.

In *Backyard Birds*, students are challenged to identify a variety of North American birds while on a class field trip. Students "observe" the target bird by collecting information about the bird's physical characteristics as well as its field marks and habitat. Students record the results of their observations to narrow the list of possibilities. The information collected enables the students to identify the bird by comparing its features to those of other birds.

Life science concepts addressed by or related to *Backyard Birds* include:

- Animals can be grouped and identified according to their characteristics.
- Animals are adapted to their environments.
- Bird wings, feet, feathers, and beaks are specially adapted for their survival.

Science process skills developed by *Backyard Birds* include:

- observing;
- communicating;
- comparing;
- organizing;
- relating; and
- inferring.

In *Backyard Birds*, students go on a bird-watching field trip and try to identify as many birds as time allows. Students have an assistant, the Observer, who scrutinizes the "mystery bird" through binoculars and reports what is seen. With the aid of the Observer, students collect and record specific information about the bird's characteristics. Using the available tools, students can record and review the observations that have been made, and keep track of the amount of time remaining for the field trip.

When sending out the Observer, students can choose the category of information they would like the Observer to report on. The seven categories are:

Category	Type of Information
size	the bird's overall length, in inches and centimeters
bill	includes shape and length
tail	includes shape and length
feet	includes leg length and foot type
wings	includes length and shape
food	includes what the bird is *currently* eating and *how* it feeds
field marks	includes primary distinguishing characteristics
"whereabouts"	the bird's *current* location in the backyard

Choosing the Time option will show the number of minutes remaining for the field trip.

Choosing the Observe option will enable the student to request information from the Observer about specific traits of the mystery bird.
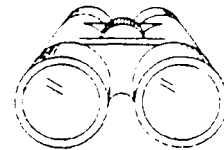
The Record option enables the student to record the observations that have been made.

The Identify option enables the student to choose from the list of all backyard birds to identify the target bird.
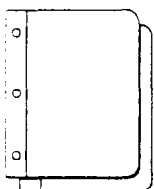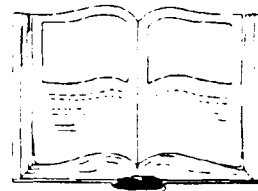
The Review option will list observations that have already been made about the current bird.

THE PRODUCT AT A GLANCE

Description

Backyard Birds is a discovery-learning simulation that allows students to collect information about a "mystery bird" by sending an assistant into the field to observe the bird. Students use the information they gather through the observation to identify the mystery bird. There are three levels of difficulty: easy, medium, and hard. *Backyard Birds* also includes an on-line field guide containing all of the information available in the *Backyard Birds* database.

Title:	*Backyard Birds*
Grade Level:	3-6, Junior High
Subject Area:	Life science
Topic:	Bird identification
Processes:	Observing, comparing, relating, inferring
Program Type:	Discovery-learning simulation
Hardware:	Apple II series computer with 128K RAM; color monitor recommended but not required
Exiting Programs:	Students may back up in a program or leave a program by pressing the Escape (Esc) Key whenever the computer is waiting for a response
Classroom Use:	Individual students or small groups

Learning Objectives

Using this courseware, students will practice:

- identifying birds according to their physical characteristics, behaviors, and habitats;

- collecting, organizing, and interpreting data in order to solve a problem; and

- locating information about specific birds using an on-line field guide.

5

DESCRIPTION OF THE INSTRUCTIONAL PROGRAMS

The two instructional programs, **The Field Guide** and **Field Trip**, use two different approaches to present the same data to students. **The Field Guide** is an unguided and open-ended learning environment wherein students can research and review the data that *Backyard Birds* has on over 120 North American birds in its database. Students can access the data by looking through the list of common bird names or common family names. Students also have access to an on-line glossary of birding terms that are used in *Backyard Birds*.

In **Field Trip**, students are given the task of identifying a "mystery bird." To complete the task, students must collect data about specific characteristics of the bird, organize the data according to the type of data collected, and analyze the data by comparing it to the characteristics of a list of the possible birds. This program has three skill levels to choose from. Three factors affect the level of difficulty: the number of birds the student works with, the number of traits the mystery bird has in common with the distractor birds, and the number of observations that the student has time for before the mystery bird flies away. Students may review the results of previous observations at any time.
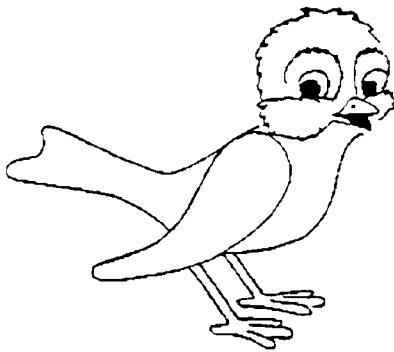
A QUICK LOOK AT *BACKYARD BIRDS*

The information provided in this section includes a brief look at the programs, an explanation of the various menu options, and a description of the Teacher Options.

Main Menu

The main menu displays four options. Option 1 tells you about the program. Options 2 and 3 are instructional programs and Option 4 ends the current session of *Backyard Birds*.

```
        Backyard Birds
  1. Information
  2. The Field Guide
  3. Field Trip
  4. End

     Use arrows to move.
       Press Return
```
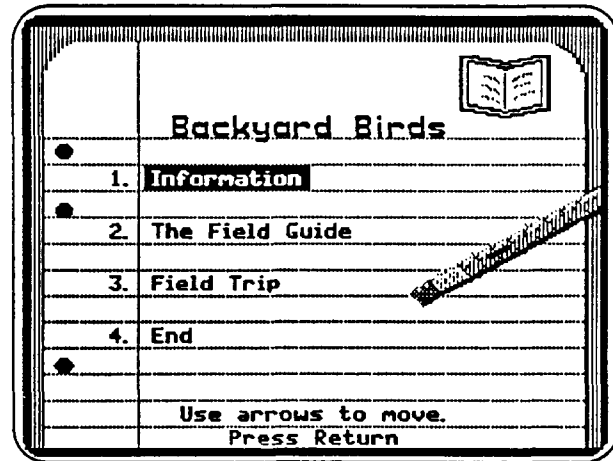
Information

Choosing Information from the main menu takes you to the Information menu, shown here. This menu allows you to choose the type of information that you would like to see.

```
           Backyard Birds
             Information

Choose the information you want:

   1. Instructions
   2. See an Example
   3. Teacher Information

Use arrows to move.  Press Return.
Escape: Main Menu
```
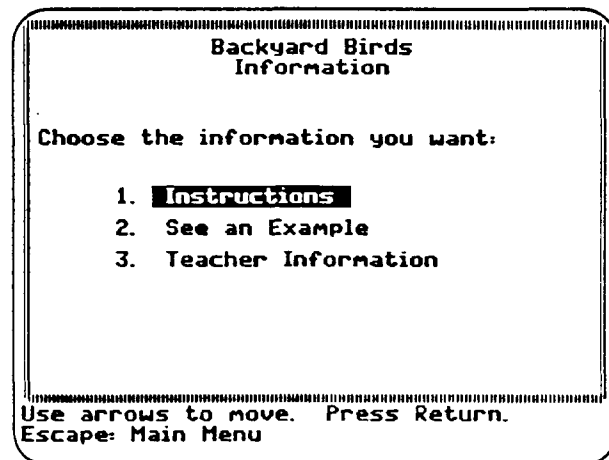
For example, choosing Instructions takes you to a series of screens that describe the goal of the program.

Choosing See an Example enables you to enter the backyard and learn the function of each of the available options. One of the screens, displayed here, describes the observations available when using the Observe option.

```
  Size
  Bill
  Wings                 You may ask
  Tail                  the Observer
  Feet                  to report on
  Food                  any of these
  Field Marks           attributes.
  Whereabouts

 TIME  OBSERVE  RECORD  IDENTIFY  REVIEW

Use arrows to move.  Press Return.
Escape: Backyard Menu
```

7
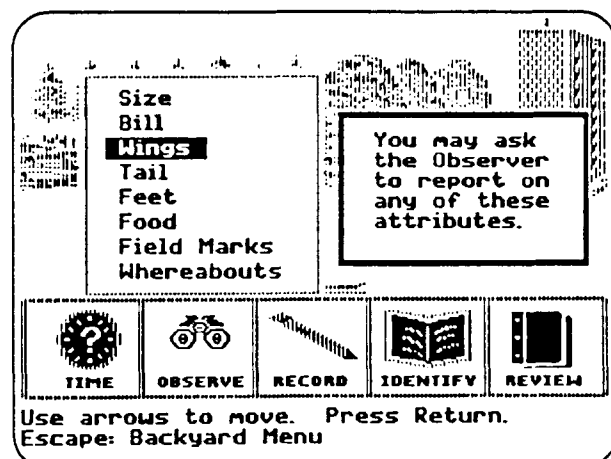
The Field Guide

Choosing **The Field Guide** from the main menu takes you to a screen that displays the Field Guide menu. You may choose to see the bird data cards by common bird name or by common family name. You may also choose to see the glossary of terms used in *Backyard Birds*.

```
┌─────────────────────────────────────┐
│          The Field Guide            │
├─────────────────────────────────────┤
│                                     │
│                                     │
│                                     │
│     1.  ███List Birds by Name███    │
│                                     │
│     2.  List Birds by Family        │
│                                     │
│     3.  Glossary                    │
│                                     │
│                                     │
│                                     │
│ Use arrows to move.  Press Return.  │
│ Escape: Main Menu                   │
└─────────────────────────────────────┘
```

Selecting Option 1 or Option 2 will display the list of choices. Choose the bird or bird family you would like to see.

If the Backyard Birds database contains only one bird belonging to the selected family, that bird's data card will be displayed immediately.

```
┌─────────────────────────────────────┐
│           Birds by Name             │
├─────────────────────────────────────┤
│   ███Acorn Woodpecker███            │
│   American Anhinga                  │
│   American Bittern                  │
│   American Coot                     │
│   American Crow                     │
│   American Dipper                   │
│   American Goldfinch                │
│   American Kestrel                  │
│   American Redstart                 │
│   American Robin                    │
│   American Swallow-tailed Kite      │
│   American White Pelican            │
│   Arctic Tern                       │
│                                     │
│ ─────────────── More ────────────── │
│ Use arrows to move.  Press Return.  │
│ Escape: The Field Guide             │
└─────────────────────────────────────┘
```

When you have selected a specific bird to look at, the data card for that bird will be displayed. The data card contains all of the available information on the bird. Use the Up- and Down-Arrow Keys to view the entire contents of the data card.

```
┌─────────────────────────────────────┐
│          Acorn Woodpecker           │
├─────────────────────────────────────┤
│ Family:        Woodpeckers          │
│ Genus & Species:                    │
│   Melanerpes foricivorus            │
│                                     │
│ Size:          Small                │
│ Bill Shape:    Chisel-like          │
│ Bill Length:   Shorter than width of head │
│ Wing Width:    Broad                │
│ Wing Tip:      Rounded              │
│ Tail Length:   Medium               │
│ Tail Shape:    Pointed              │
│ Leg Length:    Short                │
│ Foot Type:     Climbing             │
│ Food:          Some seeds           │
│ ─────────────── More ────────────── │
│ Use arrows to see more information. │
│ Escape: Birds by Name               │
└─────────────────────────────────────┘
```
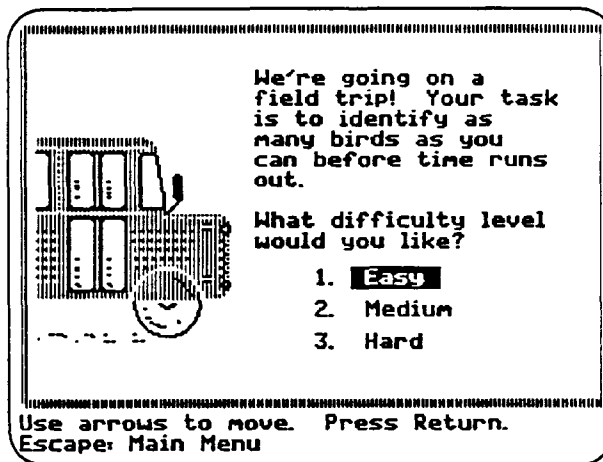
Field Trip

Choosing **Field Trip** from the main menu takes you to a screen that asks you to select one of three skill levels.

```
 We're going on a
 field trip! Your task
 is to identify as
 many birds as you
 can before time runs
 out.

 What difficulty level
 would you like?

   1. Easy
   2. Medium
   3. Hard

Use arrows to move.  Press Return.
Escape: Main Menu
```

After selecting a skill level, you will see the backyard. Five symbols, representing the available options, will appear at the bottom of the screen. Your task is to identify the mystery bird by sending out the Observer to collect data on the mystery bird.

```
┌──────┬─────────┬────────┬──────────┬────────┐
│ TIME │ OBSERVE │ RECORD │ IDENTIFY │ REVIEW │
└──────┴─────────┴────────┴──────────┴────────┘
Use arrows to move.  Press Return.
Escape: Summary
```
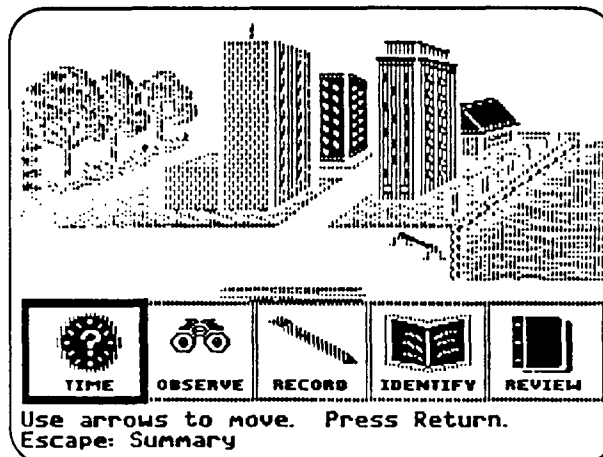
Begin by selecting the Observe option and asking the Observer to report on one of the bird's traits. Make your selections by using the arrow keys to move the highlighted box to the Observe option and pressing Return. From the menu that appears, choose the trait that will help identify the mystery bird. Use the arrow keys to highlight your choice and press Return.

You can continue to ask the Observer to report on traits of the mystery bird until you are ready to identify the bird or until the bird flies away.
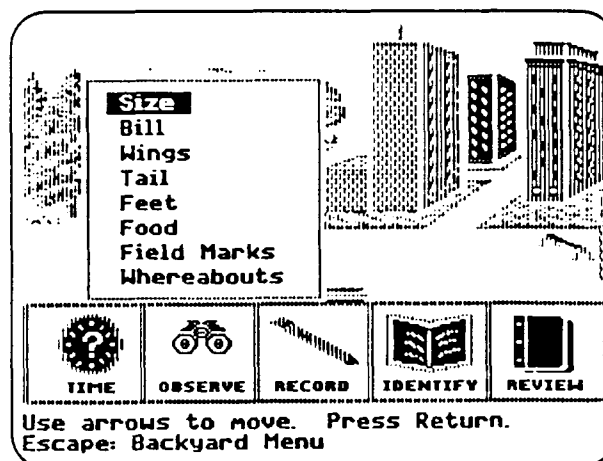
```
  Size
  Bill
  Wings
  Tail
  Feet
  Food
  Field Marks
  Whereabouts

┌──────┬─────────┬────────┬──────────┬────────┐
│ TIME │ OBSERVE │ RECORD │ IDENTIFY │ REVIEW │
└──────┴─────────┴────────┴──────────┴────────┘
Use arrows to move.  Press Return.
Escape: Backyard Menu
```

Record the information that the Observer reports to you in your on-line notebook. To do this, select the Record option to display the Record Observations screen. This option allows you to narrow down the list of birds that might be your mystery bird. It also allows you to view the list of possibilities.

```
              Record Observations

         1. Enter Observations
         2. See Birds That Match
   Size:          Unknown
   Bill Shape:    Unknown
   Bill Length:   Unknown
   Wing Width:    Unknown
   Wing Tip:      Unknown
   Tail Length:   Unknown
   Tail Shape:    Unknown
   Leg Length:    Unknown
   Foot Type:     Unknown
   Food:          Unknown

            7 of 7 birds match
   Use arrows to move.   Press Return.
   Escape: Backyard Menu
```

To narrow down the list, choose Option 1 from this menu to enter the results of the Observer's observations. Select a trait for which you want to enter information, and then make a selection from the menu that appears. As you enter the information, the database is narrowed down to include only those birds that have the traits that you have entered.

The number of birds in the current list is displayed at the bottom of the screen.

```
              Enter Observations

   Select the leg length.        ┌──────────┐
                                 │ Unknown  │
   Size:        Small            │ Short    │
   Bill Shape:  Needle-like      │ Medium   │
   Bill Length: Longer than      │ Long     │
   Wing Width:  Unknown          └──────────┘
   Wing Tip:    Unknown          │
   Tail Length: Medium           │
   Tail Shape:  Forked           │
   Leg Length:  Unknown          │
   Foot Type:   Unknown
   Food:        Unknown

            1 of 7 birds match
   Use arrows to move.   Press Return.
   Escape: Choose trait
```

Teacher Hint

The list of birds in the database originally contained the mystery bird. If traits are entered incorrectly, the bird may be eliminated from the list. If no birds match the entered traits, the number at the bottom of the screen will change to zero. Have the students think about why this may have occurred and how they might correct it. (Use the Review option to double-check their test results.)

The Review option on the Backyard menu presents a chart that records the findings of each observation of the current mystery bird. By using the Review option, you can look at a record of previous observations.

```
╔════════════════════════════════════════════╗
║ Observation      Results                     ║
║ ──────────────────────────────────────────  ║
║ Bill             conical, shorter than       ║
║                  than the width of its       ║
║                  head                        ║
║ Tail             short, pointed              ║
║ Feet             short, webbed               ║
║ Food             small fish by diving        ║
║                  under water                 ║
║                                              ║
║                                              ║
║        Press SPACE BAR to continue           ║
╚════════════════════════════════════════════╝
```

Once you believe you know the identity of the mystery bird, choose the Identify option. If you are not successful in identifying the mystery bird, you may continue to request information from the Observer and review your data until you are again ready to name the mystery bird.

Remember, the bird may fly away at any time!

```
╔════════════════════════════════════════════╗
║             Name The Bird                    ║
║ ──────────────────────────────────────────  ║
║ Pick the bird that is your backyard bird.    ║
║                                              ║
║    ▐ American Redstart ▌                     ║
║      Brown Creeper                           ║
║      Eastern Phoebe                          ║
║      Elf Owl                                 ║
║      Mountain Bluebird                       ║
║      Rose-breasted Grosbeak                  ║
║      Ruby-throated Hummingbird               ║
║                                              ║
║ ──────────────────────────────────────────  ║
║ Use arrows to move.  Press Return.           ║
║ Escape: Backyard Menu                        ║
╚════════════════════════════════════════════╝
```

Teacher Hint

Students should try to identify the mystery bird correctly on their first attempt. A positive identification on a first attempt may require making more than one observation.

When you have correctly identified the mystery bird or if the bird has flown away and you have attempted to name the bird three times, a summary of your achievements is displayed. You can then choose whether you want to attempt to identify another bird at the same level or to change levels.

```
╔══════════════════════════════════════╗
║         Summary                      ║
║        Ben Stillman                  ║
║ Birds          Easy  Medium  Hard    ║
║ ┌─────────────┬─────────────────────┐║
║ │Identified   │                     │║
║ │on first try │   2    1      1     │║
║ ├─────────────┼─────────────────────┤║
║ │Attempted    │   2    2      1     │║
║ └─────────────┴─────────────────────┘║
║                                      ║
║   1. ▐Observe a new bird▌            ║
║   2. Change level                    ║
║   3. See today's sightings           ║
║                                      ║
╚══════════════════════════════════════╝
Use arrows to move.  Press Return.
Escape: Main Menu
```

Teacher Hint

Encourage students to correctly identify several birds at a given level before attempting more difficult levels.

From the Summary screen, you may select Option 3, Show Today's Sightings, to see the list of all of the birds you have identified so far. If "Press P to print" is displayed on the screen, you may print the list of identified birds on your printer.

```
┌──────────────────────────────────────┐
│         Today's Sightings            │
│ ──────────────────────────────────── │
│  ▐American Bittern▌                   │
│  Black-chinned Hummingbird            │
│  Snow Bunting                         │
│  Whip-poor-will                       │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│ ──────────────────────────────────── │
│ Use arrows to move.  Press Return.   │
│ Escape: Summary                      │
└──────────────────────────────────────┘
```

Teacher Hint

Have your students keep a record of all of the birds they have identified in the **Field Trip** program by checking off each bird on the *Backyard Birds* Life List (page 25).

Teacher Options

Teacher Options can be accessed from the main menu by typing Control-A (press the A Key while holding down the Control Key). The Teacher Options menu enables you to work with records on student progress and to modify the programs to meet specific needs within your classroom.

```
         Teacher Options
===============================================

      1.  Student records

      2.  Program setting

      3.  Printer support


===============================================
Use arrows to move.  Press Return.
Escape: Main Menu
```

Student Records

The **Field Trip** program stores information on student progress for up to 75 students. Choosing Option 1 from the Teacher Options menu takes you to a second menu where you may select to see, print, or delete the existing student records.

```
     See/Print/Delete Student Records
===============================================
This disk stores records for
75 sessions.  When this limit is reached,
the oldest record is deleted as each new
record is saved.

6 records are currently saved.

      1.  See student records
      2.  Print all student records
      3.  Delete all student records


===============================================
Use arrows to move.  Press Return.
Escape: Teacher Options Menu
```

Student records contain the students' names, the level that they selected, and the number of successful trials compared to the total number of trials attempted. For example, the numbers (1, 2, 3) in the "Level" column refer to the skill level selected.

These numbers are read as:

1 = Easy level
2 = Medium level
3 = Hard level

The third column of the record displays the number of birds that were identified correctly on the first attempt out of the number of birds sighted. For example, 3/4 means that the student attempted to name four different birds and was correct in three of those attempts.

```
              Screen 1 of 1
Name                    Level        Result
===============================================
Menendez, David           2           1/1
Johnson, Sue              1           2/5
Kuihara, Linda            3           1/1
Stillman, Ben             3           1/2
Stillman, Ben             2           1/2
Stillman, Ben             1           2/2




===============================================
         P Key: Print Screen
Escape: Records Menu          ?: Help
```

13

Program Settings

This menu will enable you to specify whether the printing capabilities in **Field Trip** will be made available to students.

To modify the program setting, simply indicate your choice by highlighting "Yes" or "No" and pressing Return. This is accomplished by using the arrow and Return Keys.

```
┌─────────────────────────────────────┐
│           Program Setting           │
│ ═══════════════════════════════════ │
│                                     │
│                                     │
│ Do you want students to be able to print │
│ their "Today's Sightings" list from the │
│ Field Trip program?                 │
│                                     │
│              Yes ▓No▓                │
│                                     │
│                                     │
│                                     │
│ ═══════════════════════════════════ │
│ Use arrows to move.  Press Return.  │
│ Escape: Teacher Options             │
└─────────────────────────────────────┘
```

Printer Support

Backyard Birds is initially set to work with an Apple //e computer having a standard printer card located in either Slot 1 or Slot 2. If you have this setup, you do not need to do anything further. If your printer uses a different setup or if you need to enter special printing commands, you must select the Use Printer Support option from the Teacher Options menu. *Note that to connect an Apple //c, //c+, or //GS computer, designate Slot 1 and use the printer port on the back of the computer.*

Selecting the Use Printer Support option takes you to the Printer Options menu. The current printer settings are displayed at the top of the screen. These options enable you to set up your printer for use with *Backyard Birds*. Additional information about each option is listed below.

```
┌─────────────────────────────────────┐
│          Printer Support            │
│ ═══════════════════════════════════ │
│    Current slot: Search slots 1 and 2 │
│ Special commands: No                │
│ ═══════════════════════════════════ │
│                                     │
│                                     │
│      1.  ▓Set printer slot▓         │
│      2.  Set special commands       │
│      3.  Test printer setup         │
│      4.  Restore default setup      │
│                                     │
│ ═══════════════════════════════════ │
│ Use arrows to move.  Press Return.  │
│ Escape: Teacher Options Menu        │
└─────────────────────────────────────┘
```

Option 1, Set Printer Slot, enables you to specify the slot number in which the printer interface card is located. Unless set otherwise, the program will search Slots 1 and 2 for a recognizable printer interface card.

Option 2, Set Special Commands, allows you to enter commands that enable certain types of printers to operate. This option also permits you to set special printing formats. These special commands are listed in the manufacturer's printer or interface card manual. *Do not set up your printer to use a proportional font. This setting will cause the student records to be formatted incorrectly.*

A QUICK LOOK AT *BACKYARD BIRDS* (continued)

To enter special commands, type the exact characters required. When you are finished entering commands, type ^ (Shift -6) to end.

Option 3, Test Printer Setup, prints out all of the keyboard characters. If these characters are not printed correctly, check the settings on your printer, check whether your printer has been correctly connected, or consult your interface card manual for special commands.

Option 4, Restore Default Setup, returns all printer settings to their original state. The original settings provide for a search of Slots 1 and 2 and do not use special commands.

All changes made to the printer support settings are saved on the disk when you leave the Printer Support menu and are permanent until you use the Use Printer Support option again to change the settings.

USE IN AN INSTRUCTIONAL SETTING

This section of the manual describes the overall instructional approach of *Backyard Birds* and provides additional information related to using the program in an educational setting. Information on the effective use of *Backyard Birds* is divided into five sections: Preparation, Using the Programs, Student Strategies, Additional Classroom Activities, and Lab Activities.

Backyard Birds is designed to be used with a textbook chapter and/or other classroom activities on birds and the characteristics that make each animal species unique. It can be used at the beginning of the unit to introduce the topic or at the conclusion to reinforce the important topics.

The strength of any instructional software lies in the manner in which it is used in the classroom environment. The overall emphasis of *Backyard Birds* is on presenting students with a problem-solving simulation that promotes discovery learning. The program directly supports and complements actual bird-watching class activities. As a teacher, you can choose to present the concepts by using the computer, by conducting outdoor observations, or by using a combination of these two methods. The supportive and complementary nature of *Backyard Birds* gives you the opportunity to create a powerful and flexible instructional environment.

Several methods for classroom implementation of the program are mentioned below. These ideas represent suggestions. The actual selection and sequencing of activities remains up to you so that you can tailor the instruction to meet the needs of your students. In a similar manner, how much direction you give to your students depends on their own skill levels. Some students benefit from a teacher-directed approach, while others function best when allowed to explore and develop their own strategies.

Preparation

Although primarily designed for students in grades 3-6, students of many age levels may use *Backyard Birds*. Very few terms specific to ornithology have been used in these programs. The *Backyard Birds* glossary in **The Field Guide** contains explanations of many of the terms used on the birds' data cards. You may choose to introduce these terms to your younger students before using *Backyard Birds*, although understanding these terms is not required to use the product or meet its instructional goals.

Students new to *Backyard Birds* may benefit from a short demonstration of the program. The Instructions and See an Example options of Information are also designed for classroom demonstration. Several handouts are included in this manual to be used as part of an introduction to *Backyard Birds* for your students. Handout 1 introduces and explains the function of each of the five options in the backyard. Handout 2 provides step-by-step instructions for using the **Field Trip** program to help students identify their first mystery bird.

Using the Program

Encourage your students to keep a record of the trait selections and the report from each observation during their investigations in **Field Trip**. The students may record the information as they are making choices or copy the information from the review chart at a later time. Handout 3 is designed to allow the students to record their observations and the information they learn from *Backyard Birds*. Handout 4 is the *Backyard Birds* Life List. Students can use this check list to note which birds they identify in the backyard over a number of sessions. Keeping accurate records is especially important if you do not have a printer connected to the computer or if you have elected to turn off the printer option.

Handouts 5-7 provide a quick reference to page numbers in three widely used field guides.

Student Strategies

As a discovery-learning simulation, *Backyard Birds* provides students with an open environment for experimenting with and developing successful problem-solving strategies. Students may exhibit a wide variety of approaches to the problem of identifying the mystery bird as quickly as possible with the fewest number of observations.

Common successful strategies may include the following:

- Some students prefer to work in cooperative groups or pairs. In many instances, these students tend to be more successful, or at least successful sooner, than students who tend to work alone.

- Students may select "Whereabouts" first, to get a general idea of the bird's current habitat. They may then talk among themselves and relate previous experiences that narrowed the list of possibilities. For example, if the Observer reports that the bird is seen perched on a cactus, the students can review the data card for the Cactus Wren and then request information on a trait that is characteristic of that species to confirm or reject their theory. This leads to discussions about how experienced bird-watchers can quickly narrow the lists of possible birds based solely on the bird's immediate surroundings.

Although individual student approaches vary greatly, each type of successful approach commonly features information collection, careful and complete record-keeping, comparison, and analysis. Some students may not readily develop a successful strategy. Classroom discussions can, however, encourage students to share both successful and unsuccessful strategies.

Classroom Activities

Several additional classroom activities can be used to complement and strengthen the instructional objectives and processes presented by *Backyard Birds*. In many cases, the activities listed in this section are designed to be used immediately after the students use *Backyard Birds*. Some activities, however, can also be used as introductory lessons. Others can become long-term classroom activities. The selection and order of the activities depends upon your specific classroom environment.

The true value of these activities lies in the ideas, comments, and questions that arise from discussing the experience. Allow sufficient time during and after using *Backyard Birds* and the additional activities for students to share their observations, approaches, and findings. This interaction can be encouraged by having students work together in cooperative pairs and by informing them that discussion sessions will follow the activity.

Discussion Sessions

Engage your students in a discussion of their findings, using such questions as: Which trait provided the most information about the mystery bird? Which trait provided the least information? Did they have to "observe" every trait before identifying the bird? What happened if the bird flew away before they could identify it? Encourage your students to describe and explain their successful strategies.

Interdiciplinary Activities	Have your students create a scrapbook of their favorite birds. The album can be produced with pictures cut from magazines or information from your local chapter of the Audubon Society. Students can make drawings of birds they have seen in their own neighborhoods or in magazines. They may also want to try to draw the mystery bird, based on the information provided by the Observer, and compare their drawing to those found in field guides.
	Invite a speaker from the local Audubon chapter or zoo to discuss bird-watching as a hobby or research field, show live or museum-mounted birds, and discuss careers in ornithology.
	Take a real field trip into the backyard, either near the school or in the surrounding area, or to a local aviary. If possible, provide your students with field guides and Life Lists that contain all of the birds that they might see.

Lab Activities

Actual lab activities and experiments can be conducted in the classroom to demonstrate and reinforce the use of the process skills simulated in *Backyard Birds*. Included are a few experiments and instructions for their use. These can be demonstrated to the class or conducted by the students in large or small groups.

Activity 1, What Can You Learn about Birds by Observing Them?

Make and place several different types of bird feeders containing different kinds of food in locations where feeding birds can be observed. Detailed plans for the construction of bird feeders are available from many sources. Contact your local library for reference materials. After placing the feeders, watch carefully for birds to visit the feeders. It may take two to three days for the birds to first find the feeders. Keep a careful record of the kinds of birds that visit your feeders. Also, be sure to record when each type of bird feeds, what kind of food it eats, and the time of day it prefers to visit the feeders.

Use your collected information to help you answer questions such as:

- What kinds of birds are the most common at each kind of feeder?
- What is the best time of day for observing birds?
- Which feeder seems to attract the most types of birds?
- How can you design an experiment to discover why birds use a feeder? Is it the location of the feeder, the type of food in the feeder, or a different reason?

Activity 2, What Kinds of Food Comes in Bags of Birdseed Mix?

Flying takes a great amount of energy and strength. Birds, therefore, are constantly searching for seeds, insects, and other food, and readily come to bird feeders that people have set out. Several companies sell special "bird seed" mixes especially for use in bird feeders. Take a close look at these commercial "mixes," however, and you may be surprised at what you find.

First, weigh out a two-ounce sample of a commercial mix. Next, sort the seeds you find in your sample into different types of seeds. Count the number of each type of seed that you find and display the results on a graph. An example graph is shown below.
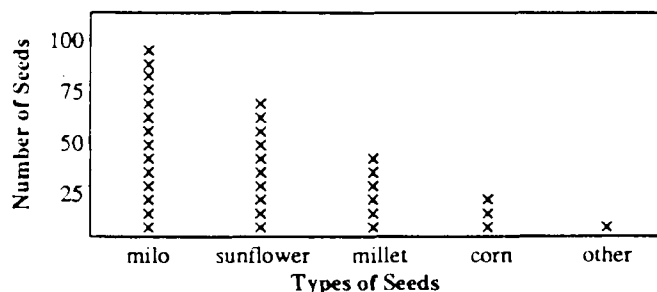
USE IN AN INSTRUCTIONAL SETTING (continued)

Use the information you have collected to answer questions such as:

- Did you find things in your sample that do not seem to be seeds? How much of this other stuff did you find?
- How many different kinds of seeds did you find? Can you identify them?
- What is the most common type of seed? The least common?
- If you planted these seeds, would they grow?
- Can you design an experiment to find the type of seeds from your sample that birds like the best?

Suggested follow-up activity: Make equal amounts of the different seeds available in separate feeders to birds in your area. Which seeds do the birds prefer? Do different birds prefer different seeds?

Activity 3, How Can Birds Be Identified?

Correct bird identification requires much skill, patience, practice, and time. In fact, several field guides have been written on this subject with each listing general rules to follow when identifying a bird. With few exceptions, a guide asks you to determine easily recognizable features of the unknown bird. For example, the primary color, size, shape, behavior, and habitat of a bird are all features that can often be determined at a glance. Students can gain additional insight into how a field guide works by creating a classroom guide to cars, furniture, or some other commonly seen items.

First introduce a bird guide to your students and discuss the characteristics that it uses to identify birds. Most guides use general (large) categories like general shape and size before using more detailed information, such as the presence of wing bars. Using the same concepts for their car guide, for example, students may decide to first use large categories such as truck, sedan, and convertible. The next step might include two-door vs. four-door sedans. At another level, they could possibly look for the presence of a blue oval emblem. Once their car guide is ready, they should try it out by using it to identify cars in a nearby parking area. A field trial will reveal some necessary modifications, but the important thing is that your students will gain a unique view of how field guides are constructed.

STUDENT HANDOUTS

On the following pages are the student handouts mentioned in the "Use in an Instructional Setting" section of this manual. Each handout is briefly described below.

Handout 1: Introducing the *Backyard Birds* Components

This handout introduces each of the options available while the student is identifying the mystery bird in the **Field Trip** program.

Handout 2: Identifying Birds: Step-by-Step

This handout describes a step-by-step approach for demonstrating the **Field Trip** program.

Handout 3: What I Found Out

This is a student data recording sheet. Students may use this form to record reports from the Observer to help them summarize their conclusions.

Handout 4: *Backyard Birds* Life List

This handout provides a list of all of the birds stored in the *Backyard Birds* database. Students may use this sheet to check off each bird identified using the **Field Trip** program.

Handouts 5, 6, and 7: Cross-Reference of *Backyard Birds* and Common Field Guides

These handouts provide page numbers for locating each bird found in the *Backyard Birds* database in three widely used bird field guides. Students may use one or more of these handouts to obtain additional information about a mystery bird—and see what it looks like— after having identified it.

Introducing the
Backyard Birds Components

Name _____

The **Time** option lets you see the number of minutes remaining in the field trip.
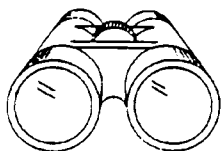
The **Observe** option lets you send out the Observer to find out about specific traits of the mystery bird.

The **Record** option lets you see the list of possible birds and narrow that list using the information that the Observer reported.
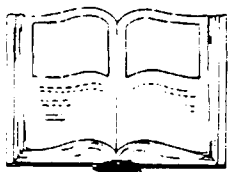
The **Identify** option lets you choose the mystery bird from the complete list of *Backyard Birds*.
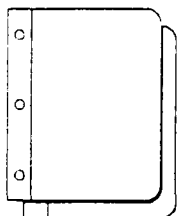
The **Review** option will show you the results of past observations made by the Observer.

Identifying Birds: Step-by-Step

Step 1.   Select **Field Trip** from the main menu, then choose the Easy level. Read the initial task screen, then press the Space Bar to enter the backyard.

Step 2.   Notice that the largest part of the screen shows the backyard. Your mystery bird is located somewhere in the backyard. The bottom part of the screen shows the options available to you.

Step 3.   To begin, choose the Observe option. The list of traits on which the Observer will report is displayed. Choose Size from the list and press Return. The Observer will appear from beneath the blind, take a look at the bird, and report what he or she has seen.

Step 4.   Read the report and press the Space Bar to see the backyard again.

Step 5.   Choose the Record option. Once in Record, you have two options to choose from: Enter Observations and See Birds that Match. Choose the Enter Observations option.

Step 6.   In the Enter Observations option, choose the Size trait and enter the size of the mystery bird. Watch the statement at the bottom of the screen, which tells how many birds are the size you entered. Press the Escape Key to stop entering information about the mystery bird.

Step 7.   To see the list of birds that match the information you entered, choose the option called See Birds that Match. If there are many birds that match, you can use the Up- and Down-Arrow Keys to move through the list. To see the complete information about a specific bird, choose a bird from the list. Press the Escape Key to return to the Record Options menu.

Step 8.   Press the Escape Key to return to the Backyard menu. Continue the process described in Steps 3-7.

Step 9.   As you specify traits on the Record Observations screen, the statement at the bottom of the screen will change and eventually read "1 of 7 birds match." If you have entered the traits accurately, the remaining bird is your mystery bird. Select the See Birds that Match option to learn the identity of the remaining bird.

Step 10.   Use the Escape Key to return to the Backyard menu. Select the Identify option. From the list of birds, choose the one that is your mystery bird.

After correctly naming your mystery bird, you may continue with a new bird, change levels, see the list of birds that you have identified today (don't forget to check them off on your *Backyard Birds* Life List), or return to the main menu. If you were incorrect, you may continue asking the Observer to report on the bird's traits and narrowing down the list until you are ready to name your mystery bird.

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What I Found Out

Name _____

Ask the Observer to report on these traits and record what you learn in the box next to the pictures. When you know enough about the mystery bird, try to identify it.

Observation	Found Out
Size	
Bill	
Tail	
Wings	
Feet	
Food	
Field Marks	
Whereabouts	
My first try:	
My second try:	
The mystery bird is:	

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Backyard Birds Life List

(for use with MECC's *Backyard Birds*)

Name_____ Date Completed_____

Instructions: Check each bird after you have sighted it.

____ Acorn Woodpecker	____ Eastern Kingbird	____ Rock Dove
____ American Anhinga	____ Eastern Phoebe	____ Rose-breasted Grosbeak
____ American Bittern	____ Eastern Screech-Owl	____ Roseate Spoonbill
____ American Coot	____ Elf Owl	____ Ruby-throated Hummingbird
____ American Crow	____ European Starling	____ Ruffed Grouse
____ American Dipper	____ Evening Grosbeak	____ Rufous-sided Towhee
____ American Goldfinch	____ Gila Woodpecker	____ Scarlet Tanager
____ American Kestrel	____ Golden-crowned Kinglet	____ Scissor-tailed Flycatcher
____ American Redstart	____ Gray Catbird	____ Sharp-shinned Hawk
____ American Robin	____ Great Blue Heron	____ Snow Bunting
____ American Swallow-tailed Kite	____ Great Egret	____ Snowy Owl
____ American White Pelican	____ Great Horned Owl	____ Solitary Vireo
____ Arctic Tern	____ Greater Roadrunner	____ Song Sparrow
____ Atlantic Puffin	____ Herring Gull	____ Spotted Sandpiper
____ Bald Eagle	____ Horned Lark	____ Steller's Jay
____ Barn Swallow	____ House Sparrow	____ Tree Swallow
____ Belted Kingfisher	____ House Wren	____ Tufted Titmouse
____ Black and White Warbler	____ Inca Dove	____ Tundra Swan
____ Black Skimmer	____ Indigo Bunting	____ Turkey Vulture
____ Black-billed Magpie	____ Killdeer	____ Varied Thrush
____ Black-capped Chickadee	____ Lazuli Bunting	____ Western Grebe
____ Black-chinned Hummingbird	____ Loggerhead Shrike	____ Western Kingbird
____ Black-crowned Night-Heron	____ Long-billed Dowitcher	____ Western Meadowlark
____ Blue Jay	____ Mallard	____ Western Tanager
____ Blue-gray Gnatcatcher	____ Marsh Wren	____ Whip-poor-will
____ Blue-winged Teal	____ Mountain Bluebird	____ White-breasted Nuthatch
____ Bobolink	____ Mourning Dove	____ White-crowned Sparrow
____ Brown Creeper	____ Northern Bobwhite	____ White-throated Sparrow
____ Brown Thrasher	____ Northern Cardinal	____ White-winged Crossbill
____ Brown-headed Cowbird	____ Northern Flicker	____ Whooping Crane
____ Bufflehead	____ Northern Mockingbird	____ Wild Turkey
____ Cactus Wren	____ Northern Oriole	____ Willow Ptarmigan
____ Canada Goose	____ Northern Pintail	____ Wood Duck
____ Canvasback	____ Osprey	____ Wood Thrush
____ Cedar Waxwing	____ Ovenbird	____ Yellow Warbler
____ Chimney Swift	____ Phainopepla	____ Yellow-billed Cuckoo
____ Chipping Sparrow	____ Pied-billed Grebe	____ Yellow-breasted Chat
____ Common Barn-Owl	____ Pileated Woodpecker	
____ Common Grackle	____ Purple Finch	
____ Common Loon	____ Purple Martin	
____ Common Merganser	____ Red-breasted Nuthatch	
____ Common Snipe	____ Red-eyed Vireo	
____ Common Yellowthroat	____ Red-headed Woodpecker	
____ Dark-eyed Junco	____ Red-tailed Hawk	
____ Downy Woodpecker	____ Red-winged Blackbird	
____ Eastern Bluebird	____ Ring-necked Pheasant	

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Cross-Reference of Backyard Birds and Common Field Guides

Backyard Birds found in *Birds of North America*, by Robbins, Bruun, Zim, and Singer. Published by Golden™ Press, Western Publishing Company, Sixth Edition, 1983.

Common Name	Page No.	Common Name	Page No.	Common Name	Page No.
Acorn Woodpecker	198	Dark-eyed Junco	334	Red-tailed Hawk	72
American Anhinga	36	Downy Woodpecker	200	Red-winged Blackbird	298
American Bittern	98	Eastern Bluebird	250	Ring-necked Pheasant	92
American Coot	106	Eastern Kingbird	206	Rock Dove	166
American Crow	226	Eastern Phoebe	210	Rose-breasted Grosbeak	310
American Dipper	232	Eastern Screech-Owl	174	Roseate Spoonbill	100
American Goldfinch	320	Elf Owl	180	Ruby-throated	
American Kestrel	80	European Starling	260	Hummingbird	186
American Redstart	292	Evening Grosbeak	310	Ruffed Grouse	86
American Robin	244	Gila Woodpecker	196	Rufous-sided Towhee	324
American Swallow-tailed		Golden-crowned Kinglet	252	Scarlet Tanager	306
Kite	68	Gray Catbird	240	Scissor-tailed Flycatcher	204
American White Pelican	32	Great Blue Heron	96	Sharp-shinned Hawk	70
Arctic Tern	152	Great Egret	94	Snow Bunting	344
Atlantic Puffin	162	Great Horned Owl	174	Snowy Owl	176
Bald Eagle	78	Greater Roadrunner	172	Solitary Vireo	262
Barn Swallow	218	Herring Gull	144	Song Sparrow	342
Belted Kingfisher	192	Horned Lark	218	Spotted Sandpiper	124
Black and White Warbler	270	House Sparrow	296	Steller's Jay	222
Black Skimmer	156	House Wren	236	Tree Swallow	220
Black-billed Magpie	224	Inca Dove	168	Tufted Titmouse	230
Black-capped Chickadee	228	Indigo Bunting	312	Tundra Swan	40
Black-chinned		Killdeer	114	Turkey Vulture	66
Hummingbird	188	Lazuli Bunting	312	Varied Thrush	246
Black-crowned		Loggerhead Shrike	260	Western Grebe	20
Night-Heron	98	Long-billed Dowitcher	124	Western Kingbird	206
Blue Jay	222	Mallard	46	Western Meadowlark	296
Blue-gray Gnatcatcher	252	Marsh Wren	238	Western Tanager	306
Blue-winged Teal	50	Mountain Bluebird	250	Whip-poor-will	182
Bobolink	296	Mourning Dove	166	White-breasted Nuthatch	234
Brown Creeper	234	Northern Bobwhite	92	White-crowned Sparrow	340
Brown Thrasher	240	Northern Cardinal	308	White-throated Sparrow	340
Brown-headed Cowbird	300	Northern Flicker	194	White-winged Crossbill	322
Bufflehead	56	Northern Mockingbird	240	Whooping Crane	102
Cactus Wren	238	Northern Oriole	304	Wild Turkey	84
Canada Goose	42	Northern Pintail	48	Willow Ptarmigan	88
Canvasback	54	Osprey	78	Wood Duck	52
Cedar Waxwing	258	Ovenbird	288	Wood Thrush	248
Chimney Swift	184	Phainopepla	258	Yellow Warbler	278
Chipping Sparrow	338	Pied-billed Grebe	20	Yellow-billed Cuckoo	172
Common Barn-Owl	176	Pileated Woodpecker	194	Yellow-breasted Chat	288
Common Grackle	300	Purple Finch	316		
Common Loon	18	Purple Martin	220		
Common Merganser	62	Red-breasted Nuthatch	234		
Common Snipe	126	Red-eyed Vireo	266		
Common Yellowthroat	288	Red-headed Woodpecker	198		

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Cross-Reference of Backyard Birds and Common Field Guides

Backyard Birds found in *A Field Guide to the Birds East of the Rockies*, by Roger Tory Peterson. Published by Houghton Mifflin Company, Fourth Edition, 1980.

Common Name	Page No.	Common Name	Page No.	Common Name	Page No.
Acorn Woodpecker	•	Dark-eyed Junco	266	Red-tailed Hawk	154
American Anhinga	40	Downy Woodpecker	192	Red-winged Blackbird	252
American Bittern	104	Eastern Bluebird	220	Ring-necked Pheasant	144
American Coot	64	Eastern Kingbird	194	Rock Dove	180
American Crow	206	Eastern Phoebe	196	Rose-breasted Grosbeak	276
American Dipper	•	Eastern Screech-Owl	172	Roseate Spoonbill	110
American Goldfinch	272	Elf Owl	•	Ruby-throated	
American Kestrel	162	European Starling	256	Hummingbird	186
American Redstart	236	Evening Grosbeak	272	Ruffed Grouse	144
American Robin	220	Gila Woodpecker	•	Rufous-sided Towhee	276
American Swallow-tailed		Golden-crowned Kinglet	216	Scarlet Tanager	260
Kite	150	Gray Catbird	218	Scissor-tailed Flycatcher	194
American White Pelican	78	Great Blue Heron	100	Sharp-shinned Hawk	152
Arctic Tern	96	Great Egret	102	Snow Bunting	266
Atlantic Puffin	38	Great Horned Owl	172	Snowy Owl	174
Bald Eagle	158	Greater Roadrunner	182	Solitary Vireo	228
Barn Swallow	202	Herring Gull	86	Song Sparrow	284
Belted Kingfisher	186	Horned Lark	200	Spotted Sandpiper	132
Black and White Warbler	232	House Sparrow	262	Steller's Jay	•
Black Skimmer	98	House Wren	214	Tree Swallow	204
Black-billed Magpie	208	Inca Dove	180	Tufted Titmouse	210
Black-capped Chickadee	210	Indigo Bunting	274	Tundra Swan	42
Black-chinned		Killdeer	120	Turkey Vulture	160
Hummingbird	•	Lazuli Bunting	274	Varied Thrush	220
Black-crowned		Loggerhead Shrike	224	Western Grebe	34
Night-Heron	104	Long-billed Dowitcher	124	Western Kingbird	194
Blue Jay	208	Mallard	48	Western Meadowlark	256
Blue-gray Gnatcatcher	216	Marsh Wren	214	Western Tanager	260
Blue-winged Teal	52	Mountain Bluebird	220	Whip-poor-will	184
Bobolink	256	Mourning Dove	180	White-breasted Nuthatch	212
Brown Creeper	212	Northern Bobwhite	148	White-crowned Sparrow	278
Brown Thrasher	218	Northern Cardinal	268	White-throated Sparrow	278
Brown-headed Cowbird	252	Northern Flicker	190	White-winged Crossbill	268
Bufflehead	60	Northern Mockingbird	218	Whooping Crane	106
Cactus Wren	•	Northern Oriole	258	Wild Turkey	144
Canada Goose	44	Northern Pintail	50	Willow Ptarmigan	148
Canvasback	58	Osprey	158	Wood Duck	50
Cedar Waxwing	224	Ovenbird	246	Wood Thrush	222
Chimney Swift	204	Phainopepla	•	Yellow Warbler	238
Chipping Sparrow	280	Pied-billed Grebe	34	Yellow-billed Cuckoo	182
Common Barn-Owl	174	Pileated Woodpecker	188	Yellow-breasted Chat	246
Common Grackle	254	Purple Finch	270		
Common Loon	32	Purple Martin	202		
Common Merganser	62	Red-breasted Nuthatch	212		
Common Snipe	124	Red-eyed Vireo	226		
Common Yellowthroat	246	Red-headed Woodpecker	188		

(• not listed in this guide)

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Cross-Reference of Backyard Birds
and Common Field Guides

Backyard Birds found in *Western Birds*, by Roger Tory Peterson. Published by Houghton Mifflin Company, Second Edition, 1941.

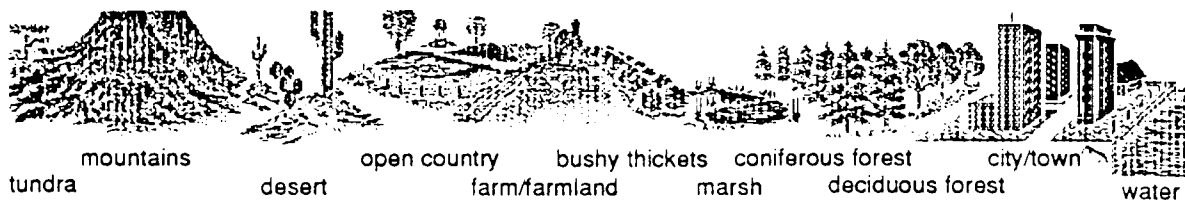| Common Name	Page No.	Common Name	Page No.	Common Name	Page No.
Acorn Woodpecker	142	Dark-eyed Junco	•	Red-tailed Hawk	50
American Anhinga	•	Downy Woodpecker	144	Red-winged Blackbird	214
American Bittern	23	Eastern Bluebird	183	Ring-necked Pheasant	68
American Coot	74	Eastern Kingbird	147	Rock Dove	114
American Crow	166	Eastern Phoebe	151	Rose-breasted Grosbeak	223
American Dipper	173	Eastern Screech-Owl	119	Roseate Spoonbill	•
American Goldfinch	230	Elf Owl	122	Ruby-throated	
American Kestrel	61	European Starling	192	Hummingbird	131
American Redstart	211	Evening Grosbeak	226	Ruffed Grouse	63
American Robin	181	Gila Woodpecker	141	Rufous-sided Towhee	233
American Swallow-tailed		Golden-crowned Kinglet	187	Scarlet Tanager	221
Kite	•	Gray Catbird	178	Scissor-tailed Flycatcher	149
American White Pelican	13	Great Blue Heron	19	Sharp-shinned Hawk	49
Arctic Tern	104	Great Egret	21	Snow Bunting	249
Atlantic Puffin	•	Great Horned Owl	121	Snowy Owl	121
Bald Eagle	57	Greater Roadrunner	117	Solitary Vireo	195
Barn Swallow	160	Herring Gull	98	Song Sparrow	247
Belted Kingfisher	137	Horned Lark	158	Spotted Sandpiper	81
Black and White Warbler	197	House Sparrow	212	Steller's Jay	163
Black Skimmer	•	House Wren	174	Tree Swallow	159
Black-billed Magpie	164	Inca Dove	116	Tufted Titmouse	•
Black-capped Chickadee	167	Indigo Bunting	224	Tundra Swan	25
Black-chinned		Killdeer	77	Turkey Vulture	47
Hummingbird	132	Lazuli Bunting	224	Varied Thrush	182
Black-crowned		Loggerhead Shrike	191	Western Grebe	7
Night-Heron	22	Long-billed Dowitcher	87	Western Kingbird	148
Blue Jay	162	Mallard	31	Western Meadowlark	213
Blue-gray Gnatcatcher	186	Marsh Wren	176	Western Tanager	220
Blue-winged Teal	34	Mountain Bluebird	184	Whip-poor-will	127
Bobolink	213	Mourning Dove	115	White-breasted Nuthatch	171
Brown Creeper	172	Northern Bobwhite	66	White-crowned Sparrow	244
Brown Thrasher	178	Northern Cardinal	222	White-throated Sparrow	246
Brown-headed Cowbird	219	Northern Flicker	138	White-winged Crossbill	232
Bufflehead	40	Northern Mockingbird	177	Whooping Crane	70
Cactus Wren	176	Northern Oriole	217	Wild Turkey	70
Canada Goose	26	Northern Pintail	32	Willow Ptarmigan	64
Canvasback	37	Osprey	58	Wood Duck	36
Cedar Waxwing	189	Ovenbird	217	Wood Thrush	•
Chimney Swift	129	Phainopepla	190	Yellow Warbler	201
Chipping Sparrow	241	Pied-billed Grebe	7	Yellow-billed Cuckoo	117
Common Barn-Owl	118	Pileated Woodpecker	140	Yellow-breasted Chat	209
Common Grackle	219	Purple Finch	226		
Common Loon	3	Purple Martin	161		
Common Merganser	46	Red-breasted Nuthatch	171		
Common Snipe	79	Red-eyed Vireo	196		
Common Yellowthroat	209	Red-headed Woodpecker	142		

(• not listed in this guide)

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BACKGROUND INFORMATION

The *Backyard Birds* model is based on data collected from a variety of bird field guides and ornithology resources. Many of these resources differ in the amount and type of information they provide. What one resource may describe as a rounded tail may be noted as square in another, while a third may leave that information out altogether. Where there have been discrepancies, the researchers relied on pictures, museum specimens, or personal experience. The categories of wing width and wing tip required the most arbitrary decisions. Other inaccuracies resulted because of the simplification required to fit all of the characteristics for all of the birds into a small number of categories. In general, the information provided is correct, but it is not always complete. This is particularly true in the case of food, range, and habitat.

Backyard Birds contains information on 129 birds from all areas of North America. Each time the **Field Trip** program is used, it randomly selects a mystery bird from this database. Note that the range and current population of the bird is not taken into account when the mystery bird is selected—the Whooping Crane is as likely to be selected as is the American Robin. Students can therefore use the program repeatedly with little chance of encountering a previously presented bird.

The specific view into the "backyard" is determined by the habitat of the mystery bird. The complete backyard is actually a panoramic representation of 11 habitats, as shown below. The view presented to the student will consist of the mystery bird's habitat with one or two adjacent displayed on either side.

| mountains | | open country | bushy thickets | coniferous forest | | city/town |
| tundra | desert | | farm/farmland | marsh | deciduous forest | water |

BACKGROUND INFORMATION (continued)

The program levels are determined by the number of observations allowed before the bird flies away, the number of distractors, and their similarity to that of the mystery bird. The chart below provides the specifics of how each of these factors affect each program level.

Level	Birds (possibilities)	Traits	Observations (before bird flies away)
Easy	7	Distinct	8
Medium	14	Somewhat similar	6
Hard	21	Similar	4

Each field trip is timed. The more difficult the level, the less time the student will have to make observations. This is to encourage the student to identify the mystery bird quickly, using the fewest number of observations possible. If the student is able to identify the bird quickly, more time will be available to identify additional birds.

TEXTBOOK CORRELATION

Backyard Birds is designed to be directly integrated into your normal elementary science lessons. The following charts correlate the instructional objectives and processes of *Backyard Birds* with specific chapters and units in five popular elementary textbook series: Scott, Foresman; Addison-Wesley; Merrill; Silver Burdett & Ginn; and Coronado (Holt, Rinehart and Winston). Also included are correlations for certain junior high level textbook series (Merrill, Holt, and Silver Burdett & Ginn). By referring to these charts, you can create lessons that directly relate to your classroom activities.

Scott, Foresman 1986

Grade	Chapter	Pages	Processes	Concepts
3	13	178-187	Observing Comparing	Animals have different body coverings. Colors and patterns of body coverings may either camouflage or advertise the presence of animals.
3	14	188-195	Observing Comparing	Animals use various kinds of defensive behaviors for protection. Animals use teeth, beaks, claws, hoofs, or poisons to catch prey and protect themselves.
4	1	4-17	Observing Comparing	Animals behave in different ways.
5	1	2-17	Observing Comparing	Living things can be classified in many useful ways. Classification is the process of grouping organisms according to a system.
5	2	18-33	Observing Comparing	Animals can be grouped according to their traits and needs.

Scott, Foresman 1986 (continued)

Grade	Chapter	Pages	Processes	Concepts
5	8	123-139	Observing Comparing Organizing	Through natural selection, species become adapted to their environments. Adaptations help organisms survive in certain environments. Species unable to adapt to their environments may become extinct.
6	2	18-31	Comparing	Organisms can be classified by the types of food they eat.

Addison-Wesley 1984

Grade	Chapter	Pages	Processes	Concepts
5	1	4-41	Observing Comparing	Organisms are classified by various characteristics. Within each class, animals can be sorted into smaller groups. Birds as a group of vertebrates have shared characteristics.
6	1	14-19	Observing Comparing	Like plant species, animal species are adapted to their environments.
6	9	268-271	Observing Comparing	Each organism competes with others for the things it needs to live.

TEXTBOOK CORRELATION (continued)

Merrill 1985

Grade	Unit	Pages	Processes	Concepts
3	5	140-146	Observing Comparing	All living things need food.
3	5	147-153	Observing Comparing	People, plants, and animals live together in a balanced system.
3	5	154-165	Observing Comparing	Different living things have different needs. Organisms live where their needs are met.
3	5	166-181	Observing Comparing	All organisms are adapted to the specific habitats in which they live.
4	5	148-159	Observing	Animals are adapted to their environments. Body coverings help animals survive. Wings and feet are also adapted for an animal's survival. Mouth parts help determine what an animal can eat and are, therefore, an adaptation for survival.
4	5	160-163	Observing Comparing	The color of an animal's body covering is an adaptation for survival.
5	1	4-21	Observing Comparing	Animals are classified by scientists according to their characteristics. Birds and mammals have special characteristics that may be used in classifying.

TEXTBOOK CORRELATION (continued)

Silver Burdett & Ginn 1987

Grade	Chapter	Pages	Processes	Concepts
4	3	46-61	Observing Comparing	Animals are classified as herbivores, carnivores, or omnivores according to the type of food they eat.
4	4	64-89	Observing Comparing	Living things have adaptations that help them survive. Most animals have structural adaptations that help them get food.
Activity	4	79	Observing Comparing Organizing Relating	The size and shape of birds' beaks are adaptations that enable birds to eat certain kinds of foods.
5	3	67-71	Observing	Birds are warm-blooded vertebrates that have feathers and wings.
6	3	48-75	Observing Comparing	Structural adaptations, such as those for feeding, locomotion, and protection, can help animals to survive. Instincts help animals survive.

Coronado (Holt, Rinehart and Winston) 1987

Grade	Chapter	Pages	Processes	Concepts
4	5	76-80	Observing Comparing	Each organism possesses traits or adaptations that make it fit to live in its environment.
4	11	168-175	Observing Comparing	Fish, amphibians, reptiles, mammals, and birds are classified into groups according to their traits.
4	11	183-191	Observing Comparing	Vertebrates are classified by traits into five classes.

TEXTBOOK CORRELATION (continued)

The following correlations are for junior high school textbooks. The chapters listed in these correlations not only reinforce instructional material appropriate to *Backyard Birds*, but also extend into information beyond that covered by *Backyard Birds*.

Holt (Physical Science) 1986

Grade	Chapter	Pages	Processes	Concepts
7-8	1	6-27	Observing Comparing	Scientific endeavors include making observations, formulating hypotheses, and testing hypotheses in controlled experiments.
7-8	12	273-281	Observing	Birds are warm-blooded and have feathers and wings.

Merrill (Focus on Life Science) 1987

Grade	Chapter	Pages	Processes	Concept
7-8	1	6-23	Observing Comparing Organizing	The scientific method has several defined steps and is used to solve problems.
7-8	4	65-73	Observing Comparing	Animals are classified according to their traits.
7-8	13	264-265	Observing Comparing Organizing	Birds have unique traits.
7-8	21	468-469	Observing Comparing	Members of a species have similar characteristics.

TEXTBOOK CORRELATION (continued)

Silver Burdett & Ginn (Life Science) 1987

Grade	Chapter	Pages	Processes	Concepts
7-8	1	1-25	Observing Comparing Organizing	The scientific method is a problem-solving process that has specific steps. A hypothesis becomes a theory after it has been tested many times and is supported by data.
7-8	2	26-47	Observing Comparing Organizing	All living things can be classified. Structure is used to classify living things. Field guides and taxonomic keys can aid in identifying animals.
7-8	13	292-299	Observing Comparing Relating	Birds have special traits and adaptations for flight. The structure of a bird's feet and beak relate to function.

CREDITS

Backyard Birds was produced by a MECC development team that included Hassan Kaganda, John Persoon, Larry Phenow, Diane Portner, and James L. Thompson, with additional assistance from the *Science Inquiry Collection* team.

MECC extends special thanks to Carol Larson for her assistance in developing this product.

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TO THE READER:

MECC has made every effort to ensure the instructional quality of this courseware package. Your comments—as user or reviewer—are valued and will be considered for inclusion in any future revision of the product. Please address your comments to:

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